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REMARKS

In the Office Action, claims 1-27 were rejected. By the present Response, claims 1, 2, 17, 18, 19, and 21 have been amended. Upon entry of the amendments, claims 1-27 will remain pending in the present patent application. Reconsideration of the rejection and allowance of all pending claims are respectfully requested.

Rejections Under 35 U.S.C. § 112

Claims 18, 19 and 21 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Examiner stated that: "The method claims 18, 19, and 21 do not appear to contain method steps. A method claim must define the invention by a series of active method steps, such as providing, allowing, and disposing." Claims 18, 19, and 21 have been amended in light of the Examiner's comments. Withdrawal of the rejection is respectfully requested.

Rejections Under 35 U.S.C. § 102

Claims 1, 2, 4-10, 17, 19, 20, and 23-27 were rejected under 35 U.S.C. § 102(b) as being anticipated by Holzman, U.S. Patent No. 4,872,502. A *prima facie* case of anticipation under 35 U.S.C. § 102 requires a showing that each limitation of a claim is found in a single reference, practice or device. *In re Donohue*, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985). Independent claims 1 and 17 have been amended by this response to further clarify their recitations. Claims 1, 2, 4-10, 17, 19, 20, and 23-27 are not anticipated because the Holzman reference does not show all of the recited features of the claims.

The Holzman reference does not anticipate independent claim 1 or claims 2 and 4-10, which depend therefrom. Independent claim 1, as amended, recites the following:

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1. (Amended) A bearing comprising:
a temperature conducting housing;
a bearing element disposed within the housing;
an oil sump to house lubricant for the bearing
element; and
at least one fan mounted to the bearing housing,
wherein the at least one fan is adapted to transfer heat from
the bearing housing by forced convection.

One of the recited features of independent claim 1 that is not shown by the Holzman reference is "an oil sump to house lubricant for the bearing element." The Holzman reference discloses a gear drive having shafts and gearing. See Holzman; col. 3, lines 30-32. The gear drive has bearing retaining hubs 23 and 24 that surround an input shaft 21 and an output shaft 22 attached to the cover 10 and base 11 of the gear drive so as to close the shaft openings in the drive housing. See Holzman; col. 3, lines 34-37. In addition, the gear drive of the Holzman reference has an oil sump to provide lubricating oil for the gearing disposed within the gear drive. See Holzman; col. 4, lines 28-33. However, the Holzman reference does not show that the lubricating oil disposed within the sump of the gear drive is used as lubricant for any bearing elements within the bearing retaining hubs. Indeed, as would be appreciated by those skilled in the art, it is not generally desirable in gear drives to provide oil or any other lubricant to a level required to lubricate or cool the bearings. Accordingly, the oil sump of Holzman could not teach the heat transfer structure of claim 1. Thus, the Holzman reference does not show all of the recited features of amended independent claim 1. Claims 2 and 4-10 depend from independent claim 1 and, therefore, also are not anticipated by the Holzman reference.

Furthermore, the Holzman reference does not anticipate independent claim 17 or claims 19 and 20, which depend therefrom. Independent claim 17, as amended, recites the following:

17. (Amended) A method for controlling the
temperature of a bearing having a housing and a bearing
element disposed within the housing, the method comprising:

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mounting at least one fan on the bearing housing to remove heat from bearing element lubricant disposed within the bearing housing;

disposing a temperature sensor within the bearing housing;

electrically coupling a logic controller between the at least one fan and the temperature sensor; and

adapting the logic controller to receive a signal from the temperature sensor and to operate the fan in response to the signal received.

One of the recited features of independent claim 17 that is not shown by the Holzman reference is "mounting at least one fan on the bearing housing to remove heat from bearing element lubricant disposed within the bearing housing." As discussed above, the lubricant housed within the oil sump of the Holzman reference is used to lubricate gearing within the gear drive. The Holzman reference does not show that the lubricating oil disposed within the sump of the gear drive is used as lubricant or coolant for any bearing elements. Thus, the Holzman reference does not show all of the recited features of amended independent claim 17. Claims 19 and 20 depend from independent claim 17. Therefore, claims 19 and 20 also are not anticipated by the Holzman reference.

In addition, the Holzman reference does not anticipate independent claim 23 or dependent claims 24 and 25. Independent claim 23 recites the following:

23. A bearing comprising:
a housing;
a bearing element disposed within the housing;
means for introducing forced air flow over an exterior surface of the bearing housing;
means for discerning a temperature of an element of the bearing; and
means for controlling the forced air flow in correlation with the temperature discerned of the element of the bearing.

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One of the recited features of independent claim 23 that is not shown by the Holzman reference is "means for discerning a temperature of an element of the bearing." The Holzman reference does disclose an adjustable temperature sensor switch 65 submerged in the lubricant oil sump of the gear drive housing. See Holzman; col. 5, lines 14-21. However, the oil sump of the gear drive is not an element of the bearing retaining hubs 23 and 24, and the oil in the oil sump of the Holzman reference does not aid in controlling the temperature of the bearing retaining hubs or the bearings disposed therein. The Holzman reference simply does not show any means for discerning the temperature of the elements of the bearing retaining hubs 23 and 24. Thus, the Holzman reference does not show all of the recited features of independent claim 23. Claims 24 and 25 depend from independent claim 23 and, therefore, are not anticipated by the Holzman reference.

Finally, the Holzman reference does not anticipate independent claim 26 or claim 27, which depends therefrom. Independent claim 26 recites the following:

26. A system comprising:
a plurality of bearings, each bearing including a thermally conductive housing, a bearing element disposed within the housing;
at least one fan affixed to the housing of each bearing;
a temperature sensor disposed within the housing of each bearing and corresponding to the at least one fan affixed on the same bearing; and
a logic controller adapted to receive a signal from each temperature sensor and to operate the corresponding at least one fan according to the received signal.

Some of the recited features of independent claim 26 that are not shown by the Holzman reference are "a plurality of bearings, each bearing including a thermally conductive housing, a bearing element disposed within the housing" and "at least one fan affixed to the housing of each bearing." The Holzman reference discloses an electric motor 43 connected to a fan 44 that is mounted to an inlet duct 40 attached to a main member 30

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of an air cooling enclosure. See Holzman; col. 3, lines 56-59. Thus, the Holzman reference does not show that the fan is secured to the bearing retaining hubs 23 and 24. Furthermore, the Holzman reference does not show a plurality of fans 44 or that a fan 44 is secured to each bearing retaining hub. Thus, the Holzman reference does not show all of the recited features of independent claim 26. Claim 27 depends from independent claim 23 and, thus, is not anticipated by the Holzman reference. For all of these reasons, claims 1, 2, 4-10, 17, 19, 20 and 23-27 are not anticipated by the Holzman reference. Withdrawal of the rejection of claims 1-15, 17, and 19-27 under 35 U.S.C. § 102(b) is respectfully requested.

First Rejection Under 35 U.S.C. § 103

Claims 11-15 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Holzman, U.S. Patent No. 4,872,502, as applied to claim 8 above, and further in view of known techniques in the art. The cited claims are not obvious because the cited references do not teach, suggest, or disclose all of the recited features of the claims.

In the Official Action, the Examiner stated that:

Holzman discloses the claimed device except for providing two fans on the housing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide two fans on the housing, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. Further, it would have been obvious to an engineer in the art at the time the invention was made (sic) modify the device of Holzman by providing a second fan on the housing and a second adjustable control circuit to control the fan operation, in order to increase the heat transfer from the housing.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to

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produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Claims 11-15 depend from amended independent claim 1 and, for the reasons recited above, the Holzman reference does not teach, suggest, or disclose all of the recited features of claim 1. Furthermore, the known techniques in the art do not teach, suggest, or disclose these features. Therefore, the cited references do not teach, suggest, or disclose all of the recited features of claims 11-15.

In addition, the recited features of the claims are not mere duplications of essential working parts of the device. For example, claim 11 recites the following: "The bearing of claim 8, wherein the at least one fan comprises at least one primary fan and at least one secondary fan." The two fans recited in claim 8 are not mere duplications because the two fans have an unequal relationship, i.e. one is a "primary" fan and one is a "secondary" fan. Claims 12-15 depend from claim 11 and recite various features of operation of the primary and secondary fans that are not mere duplications of essential working parts of the bearing. For all of these reasons, claims 11-15 are patentable over the cited references.

Second Rejection Under 35 U.S.C. § 103

Claim 16 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Holzman, U.S. Patent No. 4,872,502, as applied to claim 8 above, and further in view of Muller, U.S. Patent No.: 4,806,832.

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Claim 16 is obvious because the cited references do not teach, suggest, or disclose all of the recited features of the claim. Claim 16 depends from amended independent claim 1 and, for the reasons recited above, the Holzman reference does not teach, suggest, or disclose all of the recited features of claim 1. The Muller reference does not obviate the deficiencies of the Holzman reference in regard to these recited features of claim 1. Therefore, the cited references do not teach, suggest, or disclose all of the recited features of claims 11-15.

Third Rejection Under 35 U.S.C. § 103

Claims 18 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Holzman, U.S. Patent No. 4,872,502, as applied to claim 17 above, and further in view of Roberts, U.S. Patent No. 3,548,396. The cited claims are not obvious because the cited references do not teach, suggest, or disclose all of the recited features of the claims. Claims 18 and 21 depend from amended independent claim 17 and, for the reasons recited above, the Holzman reference does not teach, suggest, or disclose all of the recited features of claim 17. Furthermore, the Roberts reference does not obviate the deficiencies of the Holzman reference in regard to these recited features of claim 17. Therefore, the cited references do not teach, suggest, or disclose all of the recited features of claims 18 and 21.

Fourth Rejection Under 35 U.S.C. § 103

Claims 1-15, 17, and 19-27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Olah, U.S. Patent No. 2,511,479 in view of Holzman, U.S. Patent No. 4,872,502. As discussed above, independent claims 1 and 17 have been amended. Claims 1-15, 17, and 19-27 are patentable because the cited references do not teach, suggest, or disclose all of the recited features of the claims.

One of the recited features of independent claim 1 that is not shown by the cited reference is "an oil sump to house lubricant for the bearing element." The Olah reference

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discloses a gear drive having a worm 1 and worm wheel 2. See Olah; col. 1, lines 32-35. The gear drive does have bearings 4 and 5 for the worm shaft 6 and two roller bearings 10 for shaft 11 of worm wheel 2. However, the oil in the gear drive of the Olah reference is not used to lubricate or cool the bearings. Rather the oil is used to lubricate the worm 1 and worm wheel 2. Neither the Holzman nor the Olah reference teaches, suggests, or discloses an oil sump to house lubricant for a *bearing element*. Therefore, independent claim 1 is patentable over the cited references. Claims 2-15 depend from independent claim 1. If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, claims 2-15 are patentable over the cited references.

Similarly, one of the recited features of independent claim 17 that is not taught, suggested, or disclosed by the cited references is "mounting at least one fan on the bearing housing to remove heat from bearing element lubricant disposed within the bearing housing." Therefore, independent claim 17 is patentable over the cited references. Claims 19-22 depend from independent claim 17 and, therefore, are patentable over the cited references.

Furthermore, one of the recited features of independent claim 23 that is not taught, suggested, or disclosed by the cited references is "means for discerning a temperature of an element of the bearing." As discussed above, the oil temperature in the oil sump of the Holzman reference does not correspond to bearing element temperature because the oil in the oil sump is not used to lubricate or cool the bearings in the bearing retaining hubs. This recited feature is not taught, suggested, or disclosed in the Olah reference either. Therefore, independent claim 23 is patentable over the cited references. Claims 24 and 25 depend from independent claim 23 and, therefore, are patentable over the cited references.

Finally, some of the recited features of independent claim 26 that are not taught, suggested, or disclosed by the cited references are "a plurality of bearings, each bearing

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including a thermally conductive housing, a bearing element disposed within the housing” and “at least one fan affixed to the housing of each bearing.” As discussed above, the Holzman reference does not show a plurality of fans 44 or a fan 44 secured to each bearing retaining hub. These recited features are not taught, suggested, or disclosed in the Olah reference either. Thus, the cited references do not teach, suggest, or disclose all of the recited features of independent claim 26. Therefore, independent claim 26 is patentable over the cited references. Claim 27 depends from independent claim 26 and, therefore, is patentable over the cited references. For all of these reasons, claims 1-15, 17, and 19-27 are patentable over the cited references. Withdrawal of the rejection of claims 1-15, 17, and 19-27 under 35 U.S.C. § 103(a) is respectfully requested.

Conclusion

Attached hereto is a marked-up version of the changes made to the drawings and claims by the current amendment. The attached page is captioned “Version with markings to show changes made.” In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.


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General Authorization for Extensions of Time

In accordance with 37 C.F.R. § 1.136, Applicants hereby provide a general authorization to treat this and any future reply requiring an extension of time as incorporating a request therefor. Furthermore, Applicants authorize the Commissioner to charge the appropriate fee for any extension of time to Deposit Account No. 06-1315: Order No. REEL:0013/YOD.

Respectfully submitted,

Date: May 28, 2002


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please amend the application as follows:

IN THE CLAIMS

Please amend claims 1, 2, 17, 18, 19, and 21 as follows:

1. (Amended) A bearing comprising:
a temperature conducting housing;
a bearing element disposed within the housing; and
an oil sump to house lubricant for the bearing element; and
at least one fan mounted to the bearing housing, wherein the at least one fan is adapted to transfer heat from the bearing housing by forced convection.
2. (Amended) The bearing of claim 1, ~~wherein the bearing housing includes an oil sump, and wherein the at least one fan is disposed adjacent to the oil sump.~~
17. (Amended) A method for controlling the temperature of a bearing having a housing and a bearing element disposed within the housing, the method comprising:
mounting at least one fan on the bearing housing to remove heat from bearing element lubricant disposed within the bearing housing;
disposing a temperature sensor within the bearing housing;
electrically coupling a logic controller between the at least one fan and the temperature sensor; and
adapting the logic controller to receive a signal from the temperature sensor and to operate the fan in response to the signal received.

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18 (Amended) The method of claim 17, wherein disposing a temperature sensor comprises disposing the temperature sensor is disposed adjacent to the bearing element.

19. (Amended) The method of claim 17, wherein the housing includes an oil sump and disposing a temperature sensor comprises disposing the temperature sensor is disposed adjacent to the oil sump.

21. (Amended) The method of claim 18, wherein mounting the at least one fan comprises mounting at least one primary fan and at least one secondary fan.